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ABSTRACT

Berry College (Georgia) installed a new library computer and operating system, connected five buildings via a campus local area network (LAN), added eight faculty/staff offices to the LAN, completed an Internet connection, and has a name server operating. The college has also established e-mail and limited campus accounts for 300 of its 2,000 students. Some of the activities and problems encountered in the completion of Phases One and Two of this project are discussed: how to determine the community/customer needs; how to educate the community/customer on the use of the technology and its capabilities and limitations; and how to convince the administration of the need, not only for increased technology, but also for the personnel necessary to support the technology. (MAS)

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Planning, Developing and Installing a Campus Lan

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Abstract

We have installed a new library computer and operating system. We have connected five buildings via a campus LAN. We have added eighty faculty/staff offices to the LAN. We have completed an Internet connection, and have a name server operating. We have established e-mail and limited campus accounts for three hundred of our two thousand students. Some of the activities and problems encountered are discussed; how to determine the community/customer needs, how to educate them on the use of the technology, and its capabilities and limitations, and how to convince the administration of the need, not only for increased technology, but also for the people necessary to support the program. These issues and more faced us on our journey into the "Information Age". Berry College is fortunate to have faculty with considerable initiative andmotivation a substantial number of faculty had been using computers with little systematic planning from the College. Faculty were and are eager to use computers in their courses, and many did so with some difficulty.

Berry's academic computing system was originally designed with a central mainframe computer for instruction in computer science and a small microcomputer laboratory for instruction in business. The completion of a major capital campaign in 1988 enabled Berry to develop a new computer system for the library and add computers to support laboratory instruction in the sciences. In the latter part of the 1980s, computer technology became available to facilitate undergraduate studies in most academic and professional disciplines. By 1990 a plan was needed to develop computer resources for instruction campus-wide.

Berry sought the most efficient and cost effective approach to upgrade academic computing equipment and enlisted the help of the EDUCOM Consulting Group of Princeton, New Jersey. EDUCOM consultant, Dr. H. David Todd, Director of University Computing, Wesleyan University, Middletown, Connecticut, visited Berry College for two days in December, 1989. During his site visit, Dr. Todd met with representatives from each academic department, academic deans, administrators, and campus wiring technicians. He examined facilities where all academic computers were located. He submitted a report and recommendations for long-range planning in January, 1990. This report was evaluated by selected Berry faculty and staff during the following spring semester. Berry personnel concurred with the consultant's findings and recommended that the school proceed with developing an integrated, comprehensive plan for the purpose of designing a new campus-wide computer system based on Dr. Todd's recommendations. The President agreed.

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The following major weaknesses in the current academic computing system were identified:

Limited access to computers for all students. Because of demand, the two computer laboratories on campus were almost exclusively limited to the use of specific departments;

Outdated, inadequate central PDP-11/44 computer for meeting the computing needs of the majority of faculty and students;

No existing means for networking computers to support the academic program.

Following three months of planning (by a committee of faculty, staff and administrators) based on the EDUCOM consultant's recommendations, Berry decided to replace the PDP-11/44 facility with a network of personal computers for academic support, personal computers being preferred by faculty members for instructional support.

The objectives for developing the network of personal computers were:

To remove the old mainframe computer from the central academic computing center in Evans Hall;

To increase the capability for networking computer equipment in all academic departments;

To increase compatibility of computers used for computer science instruction with computers in other departments;

To increase availability to faculty and students of personal computers for general instruction and improve access to these computers for common use.

In the spring of 1990, I was hired to assist in the development of the institutional computing plan and teach in the School of Business. I began devoting full attention to the needs of academic computing and conversion to several independent, stand-alone, local-area networks from the configuration of isolated campus personal computers.

Berry established a fund for the maintenance and replacement of computer hardware and software purchased during this project. Allocations from the operating budget to this fund were expected accrue to $150,000 over five years for this purpose.

The EDUCOM consultant strongly recommended that "although the development of local area networks of personal computers is not technically more difficult than the process of installing and managing a time-sharing computer such as the PDP-11/44, the technology is different and requires development of special expertise. Berry should plan to develop networks slowly, initially, to develop that expertise."

Berry followed the advice of the EDUCOM consultant and implemented Phase I of the project in August, 1990, with development of a local-area network for a general instruction microcomputer laboratory in the Lamar Westcott Building at a cost of $46,905. When completed, this microcomputer laboratory served all students at the north end of the campus including the Departments of Agriculture, Consumer and Family Science, and Music, as well as three student residence halls.

Phase I was completed in June, 1991, with the installation of new equipment in the Lettie Pate Evans Hall computer science laboratory. This stand-alone computer science laboratory network, centrally located on campus, supports instruction not only in computer science but also in math, communications, and language arts.

The objective of Phase II of the academic computerization project, completed in December 1991, was to upgrade equipment in the computer laboratory located in Green Hall. This laboratory serves the south end of the campus, including the Departments of Business and Economics and Social Sciences.

All students majoring in business and economics, were then and are now, required to take "Business Information Management." In this course students are introduced to computer packages to facilitate problem solving and become skilled in the use of computer software, including word processing, database management, spreadsheets, and statistical analysis. A newly equipped computer laboratory would not only strengthen the effectiveness of this course but also enable the School of Business to introduce more computer problems and simulations into upper level courses.

With the completion of Phase II, there were three general computer laboratories with a common network design for academic use. This permitted greater flexibility in scheduling laboratory classes during the day and ensured access to computers by students during the evening hours and on weekends.

Phase III was to connect the existing computer labs and extend the network service to faculty/staff offices, in the buildings housing the networked computer labs. After considerable study it was decided that the most cost efficient method would be to install the campus LAN ourselves using on-campus resources rather than contracting the installation out. We were very fortunate to have a recent Berry graduate employed by Data Cable of Atlanta, GA, a cable and networking firm. He provided us invaluable assistance in the design of the network and in procuring the right equipment at reasonable cost.

In the fall of 1992, upon my appointment as Director of Academic Computing, I began investigating the possibility of an Internet connection for Berry. After considerable investigation, it was decided we would approach the State of Georgia and request a connection to PeachNet, (the Georgia educational network). After approximately two years of negotiation, we became one of the first private colleges in the state to be connected. Our connection is via dedicated 56Kb phone lines, and we maintain our own name server.

At the same time we were negotiating with PeachNet we came to the realization that our library computer (another PDP11) installed in the late 1980s, was no longer adequate for our needs. After extensive consulting with the librarian and her staff it was decided the existing system would be replaced with a turn-key system from GEAC. We now have a Motorola 9100 Unix-based system running GEAC's Advance Software. This system which is expandable should meet our needs into the foreseeable future.

Following discussions with faculty/staff to assess their needs and consulting with our "mentor," it was determined that the most efficient method would include building a campus-wide system from the two centrally located labs. We would use fiber optic cable between the buildings and Category 5, Plenum rated, unshielded twisted pairs (10baseT) in the buildings. We would continue to use Novell Netware and build a self installed and maintained Ethernet environment.

In the spring of 1994, I was given permission to hire an assistant. He would become the network manager. I chose to hire a young man who had been my student assistant for two years and had already demonstrated his knowledge, ability and intelligence. Interestingly, he is not a computer science major, but rather has a degree in communications. This has been invaluable in dealing with the campus community. After a year he is in the process of taking the Novell CNA exams.

With the assistance of student workers and employees from our physical plant, we began the tedious, and sometimes frustrating, process of installing the cable. Trenches were dug between buildings and 12-strand fiber optic cable was installed between 3 buildings the library, Green Hall (Business & Social Science), and Evans Hall (the largest academic building, housing Mathematics & Computer Science, Education and Psychology, English, Foreign Language, Religion and Philosophy, Media Center, and others).

At the same time we were installing the UTP in the buildings, setting up concentrator/hubs and configuring servers, we decided to install separate servers for each building and a common student mail server. We chose as our host an Intel P-90 based computer running LINEX.

As we installed the campus net, we became painfully aware that the axiom "It's not about hardware, it's about people" had to be dealt with. We were installing hardware and software and teaching our customers to use them. The instructional librarian came to our rescue. She had some familiarity with networks and their use in education and research. She took over the initial training and introduced a series of workshops to assist the users in developing their skills on the Net. Additionally, we offered through Academic Computing hands-on application workshops.

Dr. Todd was invited to return to Berry College in December, 1994, to again consult on the state of computing, and make additional recommendations. He concluded that Berry was moving in the right direction, but perhaps not as fast as it could. Some of his recommendations were:

Complete the campus LAN as planned. Budget funds sufficient to replace one-fourth of the faculty/staff personal computers per year. Plan to replace the network electronics every five years.

Ensure current hardware and software are available to all students in public computer labs. Expect to replace one-fourth of public use computers per year and budget accordingly.

Provide faculty with appropriate development opportunities in the use of technology, and in its integration into their specific curriculum. Provide academic support staff with contiuing in-service training.

Increase Academic Computing staff. Expect to add at least 3, but more likely 5 positions. Positions that would likely be critical would include additional network support, additional support for the public computer labs, and training and support.

Provide easy modem access for faculty/staff, and in the interim, for students to the campus LAN.

Anticipate the need to extend the network to the dorms.

Anticipate that faculty/staff, and students will need access to administrative information.

As the Net continues to grow, the problem of training and assistance continues to multiply. We are in the process of developing a help-desk which can be reached by phone or over the net.

We have completed the plan for a WWW server and hope to have it operational this fall. We are continuing the expansion of the campus LAN this summer with plans to connect at least two more academic buildings and the hopes of adding two of the five dorm areas.

We have provided system accounts, including e-mail and net browsing tools to 80 faculty members and approximately 20 academic staff members. Approximately three hundred (300) students of a student body of about one thousand eight hundred have applied for and received e-mail accounts. By the beginning of the Fall 1995 semester, we will be able to provide the same services to the students we are now providing to the faculty and staff. Selected members of the non-academic community have been encouraged to request connection to the LAN. The plan includes the connection of the Registrars Office, the Office of The Dean of Academic Support (for whom I work), The Office of the Vice President of Academic Affairs, and The Office of Institutional Research. This summer we will have completed connecting the Dean of Students Office, the Admissions Office, the Student Work and Financial Aid Office and the Internal Auditor. It is expected we will add the Office of Institutional Development late this summer. This office includes among others Development, Alumni Affairs, and Public Relations.